

BACKGROUND OF THE INVENTION

The Stow Away Collapsible Fish Cleaner (device is a fish cleaning trough) was designed and created for boat fishermen to fill a void in the market for a convenient and storable fish cleaner which works as good as others on the market, but when folded flat for storage takes up a minimal amount of room. As a 7 piece aluminum unit, it is permanently affixed together by integral hinges and stainless hinge pins, the unit opens into a "V" shaped trough with closed ends that allow fish to be placed in the trough without risk of sliding out either end. A support flange and two strap and hook assemblies affix the unit to the side gunnel of the boat. The secured unit allows cleaning a fish over the side of the boat and lets blood and small viscera drain through the hinge assemblies, outside of the boat, by way of the space in the notch design which accommodates the turned hinge tab of the opposite side. The space is adequate for drainage, yet is small enough to prevent loss of normal knives and cleaning accessories through the drain notches.

The primary design difference, not previously available, is:

- The unit folds flat for convenient storage, unlike other units which take up the bulk-space of the open trough dimensions.
- The unit has integral hinge assemblies which are part of the pieces which form the unit based upon the seven (7) interlocking hinge interfaces (although this design is an alternative to commercially produced hinges welded into the same positions) and
- The drainage slots do not allow loss of cleaning utensils such as standard fillet knives, gut spoons, fish scaling tools, etc.
- The unit provides a semi raised (5.5 inches above support flange, positioned on the existing gunnel of the boat) position which aids in ease of cleaning the fish, or allows easier unhooking and release of those fish not intended to be kept.
- This invention design was developed to meet the desire of guides and sport fishermen for maximizing their useable boat space while still maintaining the convenience of being able to clean their catch in a quality apparatus designed to

**Invention: Stow Away Collapsible Fish Cleaner
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hold and clean fish in the Pacific Northwest.

The Stow Away Collapsible Fish Cleaner will fill similar needs and desires in areas outside of where it was developed and will apply to much broader scope than for what it was initially developed. Fishermen that keep and clean fish and that are concerned for boat space, in many demographic areas will find use for this device.

BRIEF SUMMARY OF THE INVENTION

The Stow Away Collapsible fish cleaner is a V-shaped trough or holding tray with integral ends that performs similarly to welded or molded fish cleaners to securely hold fish for cleaning on the outside of the boat. The Stow Away is substantially different in that it is made up of 7 integrally incorporated hinge assemblies which allow the device to be folded completely flat without disassembly. The folded flat dimension is approximately 1.5" inches including the 1 inch gunnel support flange. The device is made ready by unfolding from the flat storage position to the V-shape with no assembly. The primary components are made of aluminum with stainless steel hinge pins making it strong and durable. The hinges are an integral part of each of six (6) parts interfacing with each other on seven (7) axes in this design. The device rests on the side gunnel of the boat on the support flange, secured by web strap and a lever type harness clip (or other quick release connector) to the boat.

BRIEF DESCRIPTION OF DRAWINGS

(The term Fig. and the corresponding first number is used identify the reference, i.e. Fig 1 is page 1/9 (BWC2-001))

Fig 0: Page 0/9 (BWC2-000) is the suggested cover drawing.

Fig 1: Page 1/9 (BWC2-001) is the flat pattern layout of the front, back and support flange parts 1, 2 and 7 identifying the parts by number as noted in the LIST OF REFERENCE MARKS USED ON DRAWINGS section.

Fig 2: Page 2/9 (BWC2-002) is the flat pattern layout of the front, back and support flange parts 1, 2 and 7 identifying the related dimensions to correctly manufacture the identified parts.

Fig 3: Page 3/9 (BWC2-003) is the flat pattern layout for parts 3 and 6 and parts 4 and 5 identifying the parts and components by number as noted in the LIST OF REFERENCE MARKS USED ON DRAWINGS section.

Fig 4: Page 4/9 (BWC2-004) is the flat pattern layout of the end parts 3 and 6 and parts 4 and 5 identifying the related dimensions to correctly manufacture the identified parts.

Fig 5: Page 5/9 (BWC2-005) is a 3-dimensional representation of the primary assembled 7 piece unit identifying the parts in relation to the flat pattern representation of Fig. 1 and Fig. 3.

Fig 6: Page 6/9 (BWC2-006) is a 3-dimensional representation of the primary assembled 7 piece unit identifying the exploded views required to show additional detail in Figs. 7 and 8.

Fig 7: Page 7/9 (BWC2-007) is an exploded top view of the hinge representation between the primary parts, 1, 2, 3, 4, 5 and 6. The interface between these parts are 3/16 stainless steel hinge pins (six each in Fig. 7).

Fig 8: Page 8/9 (BWC2-008) is an exploded and assembled view of the bottom (horizontal) hinge assembly, including the 3/16" stainless steel hinge pin joining Parts 1 and 2.

Fig 9: Page 9/9 (BWC2-009) is the dimensional and angle estimations of the typical hinge knuckle after bending of the hinge tab.

LIST OF REFERENCE MARKS USED ON DRAWINGS

(Numbers unless otherwise noted)

With regard to reference marks used, the following numbers are used throughout the drawings. These drawings are produced for use with the provisional patent application as a reference to assist in understanding the invention and (either modified or unmodified) may become a part of the permanent record as called out in 35U.S.C.113. Due to 35U.S.C.113 requirements for drawings on a Utility Patent application, drawings meeting all requirements accompany this application.

1.- The front piece making up one wall of the collapsible fish cleaning trough with integral hinge tabs and hinge notches on the bottom edge and both ends. The top has a 3/4" hem, turned inwards towards the inside center of the cleaner.

2. - The back piece making up one wall of the collapsible fish cleaning trough with integral hinge tabs and hinge notches on the bottom edge and both ends. The top has a 3/4" hem, turned inwards towards the inside center of the cleaner.

3. - The angular end piece which meshes hinge tabs and notches with part 2. The top matches the height of the hem at the intersection point on part 2 and is at the angle specified in drawing Fig. 4.

3.1 -(3.) has a radius cut out of it on the opposite end of the top which corresponds to the center hinge location. The radius will form a 180 degree radius cut out when joined by the integral hinge tabs of the adjoining piece.

4. The angular end piece which meshes hinge tabs and notches with part 3 in the center and with part 1 on the outside.. The top matches the height of the hem at the intersection point on part 1 .

4.1 - (4.)has a radius cut out of it on the opposite end of the top which corresponds to the center hinge location. The radius will form a 180 degree radius cut out when joined by the integral hinge tabs of part 3.

5. - Identical to part 4, for the opposite end of part 1.

5.1- Identical to 4.1 , for the opposite end of part 1.

- 6. - Identical to part 3, for the opposite end of part 2.
- 6.1 - Identical to part 3.1 for the opposite end of part 2.
- 7. - The support flange attached to the exterior surface (side opposite top hem) of part 2.
- 7.1 - The position of the support flange on part 2.
- 8. - The bottom (horizontal) hinge pin joining parts 1 and 2.
- 9. - The center vertical hinge pin joining parts 3 to 4 and 5 to 6.
- 10.-The corner vertical hinge pins joining part 2 to parts 3 and 5. The corner vertical hinge pins joining part 1 to parts 4 and 6.
- 11.- Bottom (horizontal) tab and notch hinge interface portion of part 1 and part 2.
- 11.1 - Bottom tabs after forming to 270 degree radius around 3/16" hinge pin.
- 11.2 - Bottom notch between formed tabs.
- 12. - Tab and notch hinge interface from part 2 to part 5.
- 12.1 - Tabs of part 2 and part 5 hinge interface after forming to 270 degree radius around 3/16" hinge pin.
- 12.2 - Notch between formed tabs.
- 13. - Tab and notch hinge interface from part 2 to part 3.
- 13.1 - Tabs of part 2 and part 3 hinge interface after forming to 270 degree radius around 3/16" hinge pin.
- 13.2 - Notch between formed tabs.
- 14. - Tab and notch hinge interface from part 1 to part 6.
- 14.1 - Tabs of part 1 and part 6 hinge interface after forming to 270 degree radius around 3/16" hinge pin.
- 14.2 - Notch between formed tabs
- 15. - Tab and notch hinge interface from part 1 to part 4.
- 15.1 - Tabs of part 1 and part 4 hinge interface after forming to 270 degree radius around 3/16" hinge pin.
- 15.2 - Notch between formed tabs
- 16. - Top edge of flat cutout part 1 which will form the inside edge of the 3/4 inch inside hem.
- 17. - The hem line which will form the top edge of part 1 when the 3/4 inch hem is made.

- 18. - Top hem 32 x 3/4" on parts 1 & 2.
- 19. - Holes for footman strap loop attachment.
 - 19.1 - 1/4" diameter, 1/2 long stainless steel phillips head screw.
 - 19.2 - 1/4" diameter nylon insert lock nut.
- 20. - Footman loop.
- 21. - Holes in part 2 and part 7 for affixing part 7 to part 2.
 - 21.1 - 1/4" diameter x 1/2 long aluminum rivet to attaching Part 7 to part 2.
- 22.- Tab and notch hinge interface from part 3 to part 4 and part 6 to part 5.
 - 22.1 - Tabs of hinge interface from parts 3 to part 4 and part 6 to part 5.
 - 22.2 - Notches between formed tabs.
- 23.- Tab and notch hinge interface from part 4 to part 3 and part 5 to part 6.
 - 23.1 - Tabs of hinge interface from part 4 to part 3 and part 5 to part 6.
 - 23.2 - Notches between formed tabs.

DETAILED DESCRIPTION OF THE INVENTION

(Description of the preferred Embodiments - How to make and use it.)

[0001] A flat pattern, Fig. 1 & 2 (BWC2-001 & BWC2-002) is laid out on according to Fig. 1 and Fig. 2 for parts 1, 2 and 7 including all tab and notch interfaces, holes and hem, items: 1, 2, 7, 7.1, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 21. The material is intended to be .080" gauge aluminum for this application, but the invention idea may utilize other materials to produce a similar device with equivalent alternative material(s). The pattern made along the bottom hinge interface (Fig 1, 11) of parts 1 and 2 of both pieces in an alternating tab and notch pattern. The combined measurements of one notch and one tab is two inches. The unit pattern is set up so that this 16 tab and 16 notch long pattern can be either lengthened or shortened in 2 inch increments (pitch) without making any significant design changes in the pattern of these two pieces. End play is 1/8" based upon the tab width of 15/16" and notch width of 1-1/16". Addition or subtraction in length in this manor requires the following two minor changes in addition to the tab and notch change. The length of the hinge pin (Fig 5, 8) and the length of the top hem (Fig. 1, 18 and Fig. 2, 18) are amended to match the change in 2 inch increments. All other parts herein discussed in this section (0001 through 0027-end) remain unchanged.

[0002] A flat pattern, Fig 3 and Fig 4 (BWC2-003 & BWC2-004) is laid out according to Fig. 3 and Fig. 4 for parts 3, 6, 4 and 5 and components: 3.1, 4.1, 5.1, 6.1, 12, 12.1, 12.2, 13, 13.1, 13.2, 14, 14.1, 14.2, 15, 15.1, 15.2, 22, 22.1, 22.2, 23, 23.1, 23.2.

[0003] The outside perimeter lines are cut from 0001 and 0002 as specified. Means of choice is computer-assisted plasma cutter or laser, or by means of a manually operated bandsaw. A commercial fabricator (Versatech, Portland, Oregon) has been utilized to perform the cutting based on specification provided herein. The methodology is common to similar fabrication shops. A comparable product can be achieved by utilization of a high quality bandsaw to follow the specified layout of the pattern for the perimeter layout. Holes corresponding to 19 and 21 are either punched @ .28125 to accommodate .25" hardware or drilled .28125 to accommodate .25"

diameter hardware in the flat fabrication.

[0004] The single piece flat pattern designs (Figs. 1-4) are intended to be bent by a commercial fabricator in press equipment to a 135 degree "U" shape for all hinge interfaces utilizing a 3/16 (or 1/4") die (Fig 7 and Fig 8). The result is a 3/16" "U" shaped hinge radius, ready to be closed with the insertion of the hinge pin and subsequent press application pressure to the leading edge subsequently closing the hinge. The specific orientation of the hinge bends is detailed in Fig 7.

[0005] The length of the rolled part of the tab is determined as follows. The hinge diameter dimension is calculated ($.080 + .080 + .1875 = .3475$ "). The circumference of a circle corresponding to the hinge diameter equals a full circle measurement of 1.0917". However the leading edge of the tab contacts itself on closure at 294 degrees of bend, requiring only 81.667% (294/360 degrees) of this circumference measurement (Fig 9.) This results in .8916" of the tab material being bent. The balance of the tab is left unbent and in the original plane of the whole part to which it is a sub-component. The midpoint of this bent measurement (.4458") is the distance from the leading edge to the break point of the 135 degree press bend performed by the commercial fabricator (or independently if not subcontracted out) with a press and 3/16 die. The distance to the break point is not critical as long as: A. All parts are done with the break point identical to one another and B. There is enough tab material that when performing the steps below for hinge closure and the closed hinge cannot be disassembled without manual pin removal. An ideal closure of the hinge places the leading tab edge in close contact with itself near the start of the hinge-tab radius bend Fig 9, Part 11.1.

[0006] Alternative technology to achieve a closed hinge is an acceptable alternative to that developed by Big Water Company, but does not represent change to the (significant) idea which is the basis of this invention. A commercial hinge die tool which uses a 3 step or 1 step process to form and bend the hinge is available which performs the same function as described in sept [0005] is available. It is manufactured by Wilson Tool International, U.K. Other similar manufacturing tools may also be available that will produce a similarly acceptable alternative to

making your own tooling for this manufacturing function.

[00007] If outsourced, delivery of the parts processed as detailed above [0001-0004] to the Big Water Company (or other) assembly facility (in the instance of outsourcing) constitutes the continuation of a manufacture process toward completion. Inspection and confirmation of the accuracy of specifications from Figs. 1, 2, 3, 4, 7 and 8 must be made and accepted as within tolerance before continuing. Otherwise the process is a seamless continuation from [0005] to [0008] through this point.

[0008] Hinge closing is accomplished in a hydraulic press. A hinge closing tool (manufactured by Big Water Company - Richardson Brothers) modeled after commercial hinge tool dies, four ea. of 1 inch wide by 4 inches long x 3/4" thick steel fingers attached to a 1/2" diameter rod with a 1 inch wide spacing. The fingers of the tool are set with the end of the fingers slightly overlapping the tabs to be bent with the rod portion away from the end of the tab. A hydraulic press cylinder is driven downward onto the fingers, at their midpoint. As compression occurs, the fingers rotate downward on the radius of the connecting rod and complete closing the hinge tab from its 135 degree semi closed position to its finished position near or at the 270 degree contact point.

[0009] Parts 1 and 2 are combined at 11 (Fig 1) & (ref Fig. 8) 11.2 and 11.3 and the hinge is closed from the 135 degree position to 270 degree closed hinge position with the hinge pin (part 8) inside the radius. (tool and methodology in [0008]).

[0010] Part 3, Fig 7, 22.1 and Part 4, Fig 7, 23.1 are combined with hinge pin Part 9, Fig 7 and Fig 9 and the hinge is closed from the 135 degree position to the 270 degree closed hinge completion.

[0011] Part 5 and Part 6 are combined by process [0005] with part 9 as in [0005].

[0012] Part 3 and Part 2 are combined at 10 (Fig. 5 and 7) and the hinge is closed from the 135 degree position to 270 degree closed hinge position with part 10 inside the radius.

[0013] Part 5 and part 2 are combined at 10 (Fig. 5 and 7) and the hinge is closed from the 135 degree position to 270 degree closed hinge position with part 10 inside the radius.

[0014] Hinge pin 9 at intersection of parts 3 and 4 and parts 5 and 6 is pulled (removed).

[0015] Part 4 and Part 1 are combined at 10 (Fig. 5 and 7) and the hinge is closed from the 135 degree position to 270 degree closed hinge position with part 10 inside the radius.

[0016] Part 6 and Part 1 are combined at 10 (Fig. 5 and 7) and the hinge is closed from the 135 degree position to 270 degree closed hinge position with part 10 inside the radius.

[0017] Rivets (21.1) are inserted from the inside through hole (21) of part 2 and then through hole 21 of part 7. Rivets are compressed, pulling together parts 7 and 2 forming the support flange. A hydraulic press and 1/2" capping tool is used to form a conical compressed rivet head on the exterior of devise and flange. The support flange, at a 120 degree bend angle is flush on part 2 at location 7.1 and extends away from part 2 perpendicular to the centerline (9) of the cleaner (also the gravitational orientation) in its' open and ready to use application.

[0018] The hinge interfaces of parts 3 & 4 and parts 5 & 6 are realigned and interfaced lining up all the hinge tabs. Hinge pin 9 is reinstalled at intersection of parts 3 and 4 and parts 5 and 6. (This is best accomplished in a collapsed position).

[0019] Two Footman loops(20) are installed in part 2, holes 19 with 4 ea 1/4" x 1/2" stainless steel phillips head screws and 4 ea 1/4" nylon insert lock nuts.

[0020] Variations on the attachment of the devise do not offer any change to the embodiments of

the overall invention herein discussed and taught above. Two nylon straps secure the StowAway fish cleaner to attachment points (supplied hardware or other suggested methods) in or on the boat. Each strap is attached to a footman loop on the cleaner by a loop of nylon strapping formed by two strap slides (or other adjusting fastener appropriate to the strap utilized). On the opposite end of the strap a harness clip (or suitable positive fastening substitution) with a strap loop appropriate the strap utilized. The strap is passed through 2 each strap slides (also appropriate), through the strap loop of the harness clip and back through each slide, placing the harness clip in a secured loop of strap. This completes the attachment hardware for the invention.

[0021]The resulting completed mechanism from the previous steps of manufacture offers a difference not previously available by means of a secured fish cleaning trough with ends, creating a fully enclosed "box" in the "open Position" that can be effectively used in place of other fish cleaning boxes and/or trays yet is of integral one piece assembled design, that can be folded flat for stowage. The folded cleaner is essentially flat when collapsed for stowage and can fit in spaces where other fish cleaning trays troughs or devises might not be stored.

MEANS OF USE

[0022] After making or obtaining the Big Water Company StowAway Fish cleaner, install the two retainment/support loops (½ loop, 2" long, #10 screw) or alternative fastening attachments (eye bolts or other means) to the gunnel or inside structure of the boat. The selected attachment location should have adequate structural integrity to support the stress created by the Stow Away and the load placed in the cleaner. Various modifications for attachment are possible and the best option is encouraged for use based upon determination of personal application. Some improvement suggestions for added strength are: Nut and bolt or eye-bolt and nut instead of a thread tapping screw (which relies on the thread strength of the material. It is recommended use of the alternative attachments for load in excess of 30 lb, or in materials (wood, fiberglass, etc) other than aluminum boat gunnel or other structure .

it is being screwed to). Variations on the attachment of the devise do not offer any change to the embodiments of the overall invention herein discussed and taught above.

[0023] Assemble support straps through footman loops.

[0024] Assemble the Harness loop to opposite end of strap. Attach Harness loop to [0016] means of attachment to boat.

[0025] Set open and ready StowAway on side gunnel of boat with support flange resting on gunnel. Hold and determine correct strap length for boat application. Adjust strap at either [0024] or [0025].

[0026] Adjust strap length to allow Stow Away to rest with end center hinge piece (part 9) approximately vertical or slanted slightly inwards at the top, towards boat.

[0027] Place fish in open cleaning trough and process.

[0028] Upon completion of all cleaning details, rinse StowAway and fold ends out, closing cleaner. Securing the folded cleaner, remove strap end harness snaps from retainment hardware and place cleaner in storage area. The cleaner is ready for subsequent use by (1) attachment of the harness snaps to their securement points, (2) placement of the cleaner on the support flange and (3) opening the StowAway cleaner, (1-2-3) for all additional uses..

[0029] Modifications in design and variations upon this can obviously be made on this present invention in light of the above teachings. These details in the above description illustrate some preferred embodiments and should not be construed as a limitation on the scope of the invention.